Bringing fertility to the desert soils of Egypt

GARDENERS OF THE DESERT

By JEAN-MARC FLEURY

Halfway between Cairo and Alexandria, on the western edge of the Nile Delta, Egyptian scientists believe they have discovered how to cultivate the desert.

"The secret," says Ismael El Bagouri, a specialist in soils at the Desert Institute, "is to accept the desert as a desert. We have planted test plots over an area of 80 hectares, and when farmers come to visit us, they leave enthused. I have closely followed a number of soil reclamation projects, but this time, I really believe in it."

After the building of the Aswan High Dam, which was completed in 1972, it was estimated that the cultivable area of the country would increase from 2.5 to 4 million hectares. Various techniques were used to restore degraded soil. "Most of the peasants tried to use the traditional techniques employed in the Nile Valley for thousands of years," says El Bagouri. The fellahs (Egyptian peasants) dug irrigation channels right on the surface. Water was now available throughout the year and the peasants stopped leaving a fallow period and planted two or three crops a year. The result: soil choked and sterilized by salt brought too close to the surface by the rising water table. For the first few years there were excellent harvests, then yields collapsed.

EXHAUSTED TOPSOIL

Because the desert sand has a very low ability to retain fertilizer, peasants enriched it with lime brought up from the bed of the Nile. "That stopped the roots of the plants reaching down far enough, and the thin layer of topsoil rapidly became exhausted," explains El Bagouri. Moreover, the lime contained seeds of harmful weeds and parasites which often were the first things to grow in the new fields.

Leaves and stalks can be used as fodder.

As for those people with more modern ideas, they tried to improve the quality of the soil by adding clay, bitumens and even synthetic polymers. The cost of these substances, however, was high and they broke down rapidly. In the case of clay, the cost of transportation alone made it impossible to apply it on a large scale.

RECLAMATION SLOWER THAN URBAN SPRAWL

Despite numerous "desert wars" waged over several decades and under several regimes, Egypt never managed to reclaim more than 300 000 hectares from the dunes of the Libyan and Arabian Deserts. This area was less than that lost to urbanization.

The new methodology evolved in a project funded in part by IDRC and directed by the American University of Cairo. It begins with an examination of the sand to be reclaimed. Right at the start, specialists identify and add the important oligo-elements such as zinc, manganese and iron whose absence can restrict the effectiveness of the main fertilizers — nitrogen, phosphorus and potassium. Instead of digging ditches for open-stream irrigation, the researchers install sprinkler pipes to avoid saturating the soil.

Then, to increase the amount of organic matter, they plant a variety of legumes suitable for arid areas: alfalfa, beans, peanuts, cowpeas, which enrich the deeper soil thanks to their nitrogen-fixing taproots. The first crops serve mainly as forage for small ruminants — goats and sheep — which in turn enrich the soil with their manure. It is only after a certain amount of organic matter has been added that the cultivation of cereals can begin.

In the first years of the experiment the yield was very small. Now, El Bagouri claims, the new methods of cultivation recover their cost very rapidly, often as early as the second year. "That's why last August the Egyptian minister in charge of land reclamation visited the test plots at the research station, half way between Cairo and Alexandria at the gates of the desert." □